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IN ITS

Contagio-Syphilitic and Vaccinal Aspects.


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ON

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In its Contagio-Syphilitic and Vaccinal Aspects.

THE first fact that we have to learn respecting leprosy is, that it is not an old historic disease of no particular interest, as some would have us to regard it. It is, on the contrary, a still existent malady common to many countries. Never known to disappear in some, it has reappeared in others to which it has been for centuries a stranger, and is liable to affect those who are much in contact with its victims, an opinion that never varied until it had declined, and so had become little known amongst us.

Half a century of territorial conquest, commercial enterprise, and colonization scheming, with their foreign labour importations from every quarter of the globe where leprosy exists, has revived the belief that the malady is contagious, —a belief that goes on extending every day the more we know of it. America, especially our colonial possessions certain South-sea islands, particularly the Sandwich group, have openly revealed the process of its epidemic growth and culture from the earliest introduction of the morbid units to its full development in endemic form. Even in Spain, so much nearer home, the same thing has been experienced, and within a shorter period. The rise and progress of the Alicante and Valencia invasions are instances illustrative of the fact.

Leprosy, like other epidemic contagious maladies, has its rise and subsidence, though these may be affairs of centuries. In the countries mentioned, if known, it had almost or entirely disappeared until its more recent introduction, and such had been its history elsewhere. In central Europe, for example, it had begun to disappear when the crusading mania revived it, giving rise to an eruption which extended throughout Christendom, England included, and which raged until it was supplanted by the French Disease or syphilitic epidemic.

From this time henceforth it began gradually to decline. Losing its intensity, breaking up and modifying in contact with its more modern representatives—syphilis and other constitutional or local affections—it continued to linger on throughout the sixteenth and seventeenth centuries; but it never altogether lost its identity, it still survives, and in some form or other it may occasionally be met with amongst us, as in almost every European people.

From all that we can learn, leprosy is now alarmingly on the increase, particularly in some of our colonial dependencies, and the fact has been causing much anxiety of later years.¹ A marked revival of public and professional interest on the subject has consequently arisen, and the leading question naturally is—Is leprosy contagious or non-contagious?² Singularly enough scientific authority is undecided on the point. Twice within the last twenty years, the Royal College of Physicians, called on to report, after serious deliberation, gave it as their opinion that it is not contagious, at least in the conventional sense the term

¹ "The Spread of Leprosy," *Brit. Med. Journ.*, Nov. 12, 1887.

² "Is Leprosy Contagious?" *Brit. Med. Journ.*, November 19, 1887.

implies—the view generally entertained.¹ But this is obviously incorrect, many circumstances have transpired within the present generation which tend to show that the notion is untenable. The reports of medical superintendents of leper asylums in our intertropical colonies are now impressing on the home government the serious fact that this terrible scourge prevails extensively among communities and peoples under our protection, and urging reconsideration of the question so that something may be done towards its suppression or control. Militarily speaking, the enemy has been long within the lines, and no danger has been till now suspected. The actual state of things has been positively ignored by us.

The French have had a similar experience in the leprous question with their colonial possessions, but being less commercial in their instincts, and more scientific in their tastes than we British are, the subject has received from them considerable attention. The Germans, and from purely scientific motives, have gone still deeper into its study, unless the latest work, a monument of patient observation and research, by a French professor, M. Leloir should eclipse all others.²

Cognisant of leprous transplantation steadily at work, it might naturally be supposed that in this scientific age, with surer means and methods of observation at our disposal, something should be known of the essential nature of the malady, and the laws which govern its propagation and diffusion. Assuredly in this direction much has lately been attempted, if not actually accomplished. The votaries of germ pathology, for example, have studied microscopi-

¹ Leprosy Committee Reports of the Royal College of Physicians, 1867 and 1887.

² "Traité pratique et theoretique de la Lepre," par M. H. Leloir. Paris, 1887.

cally the various anatomic elements and secretions of leprous subjects, and even their environment; and very often seeing what they look for, they have come on microphytic elements which enable them to declare the malady to be bacterial and contagious.¹ The history of the bacillus, whose existence is accepted, it is admitted is not yet definitely fixed, and leaves room for discussion ; apart from this, the claims of Hansen's bacillus seems settled, logically so at least, for, according to the new pathological theory, this bacillus, like all other bacilli, cannot arise spontaneously. This particular bacillus is proved to accompany exclusively the disease called leprosy, through all its various forms and manifestations and, bacillus apart, it is difficult to conceive how a malady so specifically characteristic in its nature can possibly be developed without a specific cause of some sort. In questions of disease, however, as in so many other matters, giving is not receiving. Confronted with leprous contagion, it would be desirable to know more definitely how it comports itself in operating. Given the necessary favouring conditions for invasion and development, it, at all events, must find a ready introduction through those traditionally modified and civilised congeners known as syphilis and vaccinia. The consideration of these points constitute an aspect of the question to which I would direct attention, confining myself to pathological facts comparatively new in confirmation of principles that are very old. But in doing so it must be borne in mind that whether, with the germ pathologists, we regard the presence of the leprous bacillus as essential to the malady, or whether with the anti-germ pathologists, we regard it as only interesting to observe like other products of the morbid processes involved is immaterial, both views are consistent with the object of my paper. It is

¹ Doyon, *Annal. de Dermatol. et Syphialog.*, 2me., 1886.

the positive and not the theoretical nature and character of disease that should concern us, more especially in the case of a contagious malady, such as leprosy, which is certainly the most terrible that flesh is heir to.

That lepra and lepraography has not been altogether left to modern cultivators we know. Old authorities have had much to say upon the subject, and are voluminous, but from deficiency in means of diagnosis they confounded leading forms, or identified varieties with affections considered totally distinct, with syphilis more especially. Frascator, Fallopius, and others of much later date, were well aware that the term lepra was made to cover a number of different skin and constitutional diseases. Henseler and Sprengel recognised lepra in epidemic forms very widely marked, thus justifying to some extent the opinions of the earlier predecessors who had written on the subject of the French Disease, syphilis, and who were disposed to regard it as lepra in disguise, or under some unusual form—a conclusion not improbable, seeing that the great syphilitic outbreak at the close of the fifteenth century was followed by the gradual decline of leprosy in Western Europe. If the new disease, syphilis, readily escaped the diagnosis of the middle-age and later physicians, the fact need not surprise us; the connection of the constitutional symptoms with the primary lesion would be frequently a-wanting in the leprosy, and we have only to remember that it is not so many years since the necessary relation between the secondary, tertiary, and primary lesions were clearly recognised and the nosology of the malady completed.

Leprosy in all its bearings it is here unnecessary to discuss. The classic or middle-age type in its maculate, tubercular and anæsthetic species or forms and their varieties, simple or compound, afford ample means in illustration of our subject. Simulating skin and constitutional affections in their

pathological portraiture, diagnosis often puzzles dermatologists and lepraographers the most experienced, particularly where syphilis is in question. Here all differentiation may at times escape us, even to necrosis of the septum nasi, and the loss of the nose itself, accidents that have been regarded as pathonomonic of syphilis; this both Danielsson and Leloir attest. In comparing the morbid features of lepra and syphilis, the most akin, positive distinction is occasionally impossible. Symptoms objective and signs subjective may assist us little. Under the circumstances, it would be well to know what the microscope reveals. Kabyle lepra, which may be considered as the nearest syphilitic ally, is believed by those tribes who know it, to be as often the parent of lepra as its offspring. Bacillographers might assist us and satisfy us as to whether the specific mycophyte, the bacillus of Klebs, is syphilitically present. Unless bacteriology escapes the universal law of evolution, contended for in the origin of contagia but recently, this ought to decide the question of identity, at least, for those who attach importance to the theory of germ pathology. But whether the bacillus be present or no, the law, we hold, obtains.¹ To summarize the natural history affinities of lepra with syphilis, there is the lengthened period of incubation. Feelings of malaise, lassitude and rigors usher in the malady. Ulceration of the mucous membrane of the mouth, throat, and nostrils; scaly, pustular or phlegmonoid eruptions; tuberculous condylomata, shedding of the hair and nails, necrosis of the phalanges, diminished sensation. Lastly, muscular paralysis due to implication of the cerebral meninges and spinal cord may supervene, resemblances which in their totality, and notwithstanding notable differences, show the

¹ "The Origin of Contagia," by A. M. Brown, M.D., 1884.

distinction between lepra and syphilis to be not so much in kind as in degree and modes of manifestation.

Within the century this view has gained credence. Many authorities might be quoted who regard leprosy as having lost itself in syphilis, and its congeners such as the Kabyle leprosy of Algeria, the Yaws of South America, the West Indian and South Sea Islands, the Pian of the West Coast Africa, and even the Sibbens nearer home. And this is not all; a host of writers, English, French, and German, suspect that syphilis may be capable of giving rise, or at least being the means of communicating lepra, thus strengthening the general belief among the races of those countries named, that such is really the case.

So much for lepra and lepraographers in relation to our special examination of the subject until fresh attention has been given to it, by those investigators we now refer to; predecessors excelled in experimental means and methods of inquiry, if not in general observations, great advances have been made within this fresh field of research. But of all the contemporary investigators, and they are numerous, who have applied themselves to the study of leprosy, particularly as to the mode by which it is communicated from individual to individual, we know of no one who has done so with such rare sagacity as Arning.¹ This authority has instituted his researches under every necessary condition. In Hawaii where the malady has been introduced of recent years, and is now in full development; he carefully examined the microphytic elements of the water, air and food, &c. Here results were negative, and his work may not be conclusive, but provisionally at least, it supports the view that lepra, as we know it, comes directly from the leper; is, in fact, contagious, but not infectious, as is cholera, typhoid fever, and some other zymotic maladies.

¹ E. Arning, "Monatshifte fur Prat. Dermat.," 1887.

Investigating sanitary conditions, even vaccination did not escape unheeded. This practice the native population violently accuse of contributing to the propagation of lepra. Arning with an impartiality rare in medical theorists, confirmed the probable accuracy of the popular conviction. He recognised and traced the existence of leprous centres in connection with vaccination centres; and seeing the constant liability of practitioners to deal with vaccinifers of leprous taint or habit, he insisted on the exclusive use of animal matter, and the necessity of disinfecting instruments and appliances at every operation. But for the germ-pathologists his great achievement was bacterial. Examining vaccinifers Arning came on the specific leprous bacillus in the vaccinal lymph and crusts of lepers vaccinated with a view to ascertain if this were really possible, a fact never to be lost sight of.¹

It is true that it was only in the tubercular form of leprosy that the bacilli were met with. This, however, is a minor matter; to minds the least intelligent or cautious, it shows the duty of regarding every leper, tubercular or non-tubercular, with suspicion. Simple taint or habit, where it can be detected, should be no exception. When we come to note a recent medical disclosure bearing on this point, and which has been allowed to pass unheeded for the reason, I presume, that it tells against Jennerian and Pasteurian theory and practice, the necessity for strictest caution will be obvious. Hypothesis and specific bacilli apart, the observations of Arning, and alas, of too many who do not care to confess it, vaccination is capable of actually transmitting lepra from the leprous to the non-leprous. The fact is unmistakable, and our duty is to

¹ "Mémorial sur la Lèpre," par M. Ernest Besnier, *Bull. de la Acad. de Med.*, Paris.

make mankind and the medical profession clearly comprehend what this implies.

These statements advanced, let us now revise the order of inquiry indicated. From facts of observation and analogy, are we not justified in assuming that the syphilitic leper with lesions soft or indurated, may be capable of communicating the bacilli or other specific contagious elements of lepra? It is to be feared such is the case, and that we have here one explanation, at least, of the reason why syphilis is everywhere so generally regarded as an exciting cause, agent and factor of contamination in all new leprous centres in America and Polynesia. I say at least one explanation and perhaps not the chief one, for there is another which, until now, has been entirely overlooked, and must therefore, be particularly referred to.

To keep the question clear before us, it will be well to remember what has been stated as to the origin of syphilis. If that point is undecided, the malady has certainly been awarded a relationship with lepra. Though of much more recent growth and apparently specifically distinct, no matter what the difference may be, or however difficult to distinguish, the careful observation of syphilis in the leprous and conversely of leprosy in the syphilitic, proves that both maladies may co-exist in the same subject without undergoing any change in character or nature. Clinical observation and experiment alike have shown it. The Norwegian inoculation of leprous subjects with syphilitic matter was followed with results as decided as anything that those syphilitic vaccinated with leprous lymph could show, though that is much more serious and concerns the purity of the whole communities. While recognising their distinction, facts oblige us to conclude that syphilis, by diminishing constitutional resistance and freeing epithelial barriers, will necessarily favour the development of lepra in those

constitutionally predisposed, and even be the means of communicating it from one to another where abraided surfaces exist.

If there was nothing more than this it would be enough. But there is, unfortunately, something more, and that is vaccination itself. This fact, though too long overlooked, must necessarily be a cause of calamity in leprous areas as it is now known to have been, and must continue to be in areas free from leprosy, so long as vaccination is in practice.

Arning, as we have seen, not only proved the communicability of leprosy by vaccination, he also did his best to prevent it by insisting on the substitution of calf lymph for human lymph and the disinfection of lancets and appliances. By the use of calf lymph and clean lancets, vaccinifers in non-leprous communities, are no doubt safe from human lepra and human syphilis. But what about vaccinal syphilis whether from the arm or calf, and which is in no respect of venereal origin, but due to the inherent—though mostly dormant—natural history character of cow-pox itself. That syphilis is communicable by vaccination is proved. The evidence in sporadic and epidemic instances, is too conclusive to be longer questioned. But so closely is it sometimes mimicked in vaccination, even by the purest ordinary lymph, that it seems impossible, in the absence of positive proof, to decide whether the symptoms are venereal or vaccinal.

Now that this pathological fact has been brought to light, it would be well that the intelligent should profit by it. Thanks to the recent publications of White and Creighton on the subject, they are now enabled to do so. Within the past three years, after quite a century of vaccine faith and practice, scientific criticism has for the first time been brought to bear on the original records of its revelation.

The grand Jennerian legend has been sifted to its basis, and already the egregious fictions covered by the terms *variola vaccinæ*, and *spurious vaccinia*, patently exposed.¹ It is now clearly shown that the real affinity of cow-pox is not to the small-pox but to the great-pox. By the degeneration or retroversion of *vaccinia* to its original or primitive type, it is sometimes impossible, as already stated, to discriminate with certainty between the two affections.

To ascertain the reason of this fact, the natural history of cow-pox has had to be re-examined, and its original character and effects upon the human subject compared with that of syphilis. This is what Dr. Creighton has done, and he has shown that from their close resemblance and kindred nature all sensible difference between them is at times effaced, thus justifying the opinion so often expressed in Jenner's time and since, that cow-pox was humanly venereal in its origin, and often tended to assert its natural character, however modified by long repeated human vaccination; a misfortune we have too often to deplore, and persistently misread though perfectly intelligible.

Though the roseola of vaccination is not exactly that of syphilitic roseola, the malady it indicates means something of the same kind. The ordinary vaccine pock is in all respects a chancre, apt to be indurated and to excavate beneath the scab, which when not adherent, often shows its ulceration in phagedemic form. Constitutional symptoms are generally in abeyance or insignificant, but degeneration of the vesicle to an indurated sore may be followed by roseola, scaly and even pemphigoid eruptions; by ulcerative patches on the mucous membrane of the mouth and throat, condylomata or mucous

¹ "The Story of a Great Delusion," by William White, 1885.

tubercles about the genital and anus, &c. As the malady runs through its course like syphilis, even tertiary lesions may find a place. Such is the conclusion which an impartial study of the natural history of the cow-pox has arrived at.¹

The foregoing facts, which have been so recently acquired, supply the second factor in the assumed alliance of lepra and syphilis, and their constantly remarked co-existence in epidemic and sporadic forms of lepra in new leprous countries. To judge from analogy, the assumption may be taken as correct. The leprous habit is no protection from cow-pox or vaccinia. Latent or declared, its susceptibility to the action of vaccine virus, is as great as that of the non-leprous habit, and the action of which by reversion to the primitive type, no less markedly shows its quasi syphilitic features, and an even greater liability to aggravation, not only of its own mischief, but also of the mischief of the leprous habit latent or declared.

Thus the communicability of lepra by syphilization must be regarded as established. That the communicability of lepra by vaccination is positively so, can no longer be doubted. Henceforth then, medical practitioners, and those who stand in need of them, will feel themselves obliged, whatever may be their theories on the matter, to recognise, without equivocation, the fact that there is a leprous vaccine, as there is a syphilitic vaccine or something like it, to divide their attention and imperiously demanding to be dealt with.

If the inoculability of lepra be still undetermined in an experimental sense, its natural history and its clinical observation, supply ample evidence that its communicability by vaccination can no longer be disputed. As already stated, the unanimity and persistency with

¹ "Cowpox and Vaccinal Syphilis," by Charles Creighton, M.D. 1887.

which vaccination in markedly leprous countries is charged with propagating and disseminating the malady, the well confirmed coincidence of leprous centres with vaccination centres, and the discovery of specific bacilli in those leprously vaccinated, ought to satisfy all who are capable of weighing evidence, or of rational reflexion that controversy on the question must, and will, ere long, be silenced.¹

The recent disclosure by Professor Gairdner before alluded to, comes most opportunely at this juncture. The interest excited by Arning's experiments and observations, by M. Leloir's remarkable treatise and the discussions of the Medical Academy of Paris, ought to give it much importance when the contagious character of lepra has to be seriously reconsidered in the future, for then, assuredly, the vaccine medium will be the hardest fact that will have to be dealt with. Much credit is unquestionably due to Professor Gairdner for his contribution to the cause of impartial science and humanity, and we willingly award it. It is, however, much to be regretted this has to be done with some reserve. It is, for instance, no less difficult to understand the apologetic spirit in which the deplorable facts are conveyed, than it is to justify the reticence of the professor's quondam pupil in the matter. Regard for professional susceptibilities, doctrinal or ethical, even when hallowed by tradition, may be very well in its way, but it is somewhat out of place when the health and happiness of thousands are at stake. This possibility gives cause for grave reflection, and entails a degree of moral responsibility that all of us should endeavour to see fully discharged. If these remarks seem severe to any one, it should be remembered that the nature of our subject justifies it. This,

¹ Evidence of Dr. R. Hall Bakewell, Vaccinator General for Trinidad, Answer 3563, Report of the Select Parliamentary Committee (1871) of Inquiry into the Operation of the Vaccination Act of 1867

however, does not affect the value of the communication itself, nor of its authoritative source.

In this report, of great, if not unqualified, interest, Dr. Gairdner gives us his experience in two cases of leprosy, with statements bearing on the question—is leprosy communicable through vaccination? It would be difficult to carry demonstration further in the affirmative than this singular record shows.¹ As we have seen, neither the evidence nor the conclusions are by any means novel, even if they be anti-doctrinal. They are the common property of many of practical experience in various leprous countries abroad, and from such impartial sources an accumulating mass of data, confirmatory of the fact, is already available. It would, of course, be folly to expect that in medicine—a profession so influenced by theoretic and dogmatic preconceptions—conviction will be readily brought home to all, and discussion set at rest. There is, however, little doubt but that even minds the most opposed to inconvenient facts, will be induced to see that not only does the question of the contagiousness of leprosy now present itself in a new aspect; but also that its inoculability by Jennerian vaccination admits of scientific discussion, the fact being now clearly proved, and that wherever the dangers of vaccination come into question, opposing views and attitudes must be the less irreconcilable.

The dangers consequent upon leprous contact have hitherto been under-estimated. It is true that lepers, immigrant or indigenous, when met with in the larger European capitals, have rarely given rise to the charge of contaminating those who come in contact with them. Their accommodation and management in public and private hospital establishments, the homes of religious communities, or even that of the family with safety, would seem to imply

¹ W. T. Gairdner, M.D., *Brit. Med. Journ.*, June 11th, 1887.

its non-contagious character as generally accepted. Few instances of contamination are as yet recorded, at least so far as is ascertained. But the fact taken by itself is of little weight, and is no more than might be reasonably expected.

In common with other communicable diseases, proper care reduces contagion to a minimum. The affected are placed beyond the reach of filth, poverty, and social promiscuity, and what is more for the safety of others, vaccination. But regarding leprosy as non-contagious, and permitting, without inspection and control, the importation of a foreign class irrespective of diseased condition, cannot possibly show the like result at least in England.¹ Wide-spread in our imperial possessions, leprosy subjects find ready transport to our shores, and in a few years it will be surprising if the contagious evil contributed by them does not find a place in the list of current maladies. The grown-up leper on whom disease is manifest, might be medically and humanely dealt with, but what of the immatured and young in whom there is little or no trace to raise suspicion? In our extensive maritime relations with other countries, many of them our own possessions, where lepra is endemic, many such will assuredly annually arrive, and for a time at least find homes, and oftener in poverty than comfort, and they will leave before the malady has shown itself. The higher class who arrive for educational objects must not be overlooked in the account. Both of Professor Gairdner's patients give evidence of this, and, we may be quite sure, these are by no means solitary instances.² Victims of leprosy vaccination, they remind us that this is a vaccinating age; where it is not voluntary, but compulsory. It is

¹ "The Spread of Leprosy." Letter by H. P. Wright, *Times*, November 2nd, 1887.

² W. T. Gairdner, M.D., *Brit. Med. Journ.*, October 8th, 1887.

compulsory here in England, and those who have escaped the infliction before arrival have infinitely little chance of doing so after it. The very young and destitute have no chance; otherwise, public schools and charitable institutions, are closed to them. The adult has little more. Indian lascar or Chinese coolie finds his way to the seaport or larger city slum, if not to the public charitable institution where the official vaccinator is actively at work, and little scrupulous. Unless the vaccination act be carelessly enforced, what might not occur? Precisely that which we should naturally expect, and which has to be deplored in the cases alluded to. But there is more than this. There is the seaport and city slum, and the boarding house dens with their insanitary promiscuity. Such have always been a favourite starting point for foreign epidemic invasion, from cholera to pest, and must afford a ready passport to leprosy, as they have done before in earlier times. This process once fairly set going, and the necessary time allowed, should we be surprised to find leprous centres of contagion forming themselves once more within our limits? We should say no.

Those who may feel disposed to think all this most unlikely, I would strongly remind of what has happened on shores, which, if not neighbouring, are not very far removed, namely, in Spain, and refer them to the origin and outbreak of the leprous epidemics of Valencia and Alicante now prevailing.¹ A very casual examination of the cause may perhaps induce them to be of our opinion; and not only so, but also to see the necessity of calling the attention of those in authority to the neglect of that pestiferous contingent, with which the imperial dependencies endow the mother country, and of urging that suitable

¹ W. Jelly, *Brit. Med. Journ.*, July, 1887. M. Polio, Vice-Consular Report to the French Minister of Foreign Affairs, 1887, on "The Leprosy"

measures of inspection and protection be considered, and that vaccination, of whatever kind, be at least materially restricted.

This completes the survey of the aspect of leprosy I have chosen for my subject ; let me now briefly resume the chief conclusions logically deducible from it. That there may be no ambiguity in what all this implies, I emphasize conclusions, feeling assured that they are such as will ultimately meet with recognition.

Leprosy is a disease which still occupies a prominent place in the list of human maladies, and which, though not generally epidemic, occasionally assumes that character. Observed from earliest ages, its cause and origin remains unknown. It is evidently non-spontaneous, specific in its nature, and has a definite bacterial element. It is contagious and transmissible in various ways, some of which are known. Exclusively a human malady, its sole medium of communication is seemingly by direct contact of man with man, and it is to the individual affected we ought to look for it, rather than to race or country. Though variable in its contagious incidence, it is certainly transmissible by syphilis and vaccinia. Wherever leprosy has been recently introduced into countries or communities where these endowments of modern civilization are established, this fact is well attested by the deeply rooted conviction of the masses on the point, an impression shared by many impartial medical observers.

The cause and origin of syphilis, or the great-pox, is as little known as that of leprosy, but from an occasional resemblance suggestive of affinity to the latter, it has frequently been affiliated with it. The cause and origin of vaccinia or cow-pox is quite as little known as either,

but again from occasional resemblance suggestive of affinity with syphilis, it has, in turn, been affiliated with that malady.

Whatever may have been the parentage or family relationship of these three diseases, they have been long enough sufficiently distinct to enable them to operate separately on their own account, and to do so through the medium of each other when occasion serves. Here as elsewhere Jennerian and Pasteurian prophylactic pathological homœopathies are set at naught. The leprous habit susceptible to the syphilitic and vaccine viruses is capable of transmitting itself by means of them, and thus these specific maladies may run their parallel and simultaneous courses in the same subject as may be observed in new leprosy centres, where syphilis and vaccination have been previously established.

The syphilitic and vaccinal elements in contact with their original progenitor, lepra, as may be reasonably assumed, become liable to aggravation of themselves, or of the constitutional leprous habit, and confusedly lose their distinctive features in the morbid whole. The leprous element transmitted to the syphilitic or to the sound in habit by vaccination, has a tale to tell which is still more serious, and concerns whole communities.

This picture is by no means fanciful. Leprosy is now much better known and understood than formerly by those who give it their attention. Its pathology and modes of propagation have been carefully studied by means and methods altogether new. External conditions, such as misery and degrading social promiscuity, we know are certainly its nursery; but we also now know it to be contagious mainly, first by direct leprous contact under the above conditions; secondly, by the leprous virus of the open syphilitic lesion; and, thirdly, by leprous lymph from the ordinary vaccine vesicle.

Therapeutically helpless medicine has only certain general measures available for prevention and control. Unfortunately, these are based on principles which, if simple in themselves, are difficult of application ; namely, the judicious restriction of vaccination, animal or human ; measures for the suppression of syphilis and syphilitic intercourse ; insistence on stricter attention to public and private hygiene ; amelioration of the condition of the poorer classes ; and finally, restrictive and protective measures under certain circumstances, which, far removed from the iniquitous regime of a bygone age, will leave us faithful to the sacred principles of personal freedom and humanity so often disregarded in such matters.

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